

WHAT IS CLAIMED IS:

- 1 1. A liquid jetting head, comprising:
 - 2 a first substrate, which defines a plurality of pressure generating
 - 3 chambers, the first substrate including a vibration plate which forms a first
 - 4 surface of the first substrate, and formed with a first through hole;
 - 5 a plurality of piezoelectric elements, each provided on the vibration
 - 6 plate so as to associate with one of the pressure generating chambers, each
 - 7 piezoelectric element comprised of an upper electrode, a lower electrode and a
 - 8 piezoelectric layer provided between the upper electrode and the lower
 - 9 electrode;
 - 10 a second substrate, bonded onto at least the first surface of the first
 - 11 substrate, the second substrate formed with a second through hole
 - 12 communicated with the first through hole;
 - 13 a communicating portion, at which the first through hole and the
 - 14 second through hole are connected; and
 - 15 a laminated film, including a coating layer comprised of a resin
 - 16 material, the laminated film provided on an inner wall face of the
 - 17 communicating portion.
- 1 2. The liquid jetting head as set forth in claim 1, wherein the first through
- 2 hole, the second through hole and the communicating portion serve as a
- 3 reservoir which is a liquid chamber common to the pressure generating
- 4 chambers.

- 1 3. The liquid jetting head as set forth in claim 2, wherein the laminated
2 film is covered with a protective film comprised of a resin material.
- 1 4. The liquid jetting head as set forth in claim 1, wherein the first through
2 hole, the second through hole and the communicating portion are serve as a
3 positioning member.
- 1 5. The liquid jetting head as set forth in claim 1, wherein the laminated
2 film is formed on an outer peripheral face of a bonding surface of the first
3 substrate and the second substrate.
- 1 6. The liquid jetting head as set forth in claim 1, wherein the coating
2 layer is comprised of an adhesive agent bonding the first substrate and the
3 second substrate.
- 1 7. The liquid jetting head as set forth in claim 1, wherein the coating
2 layer is comprised of at least one of an epoxy-based resin, an acrylic-based
3 resin, a urethane-based resin and a silicone-based resin.
- 1 8. The liquid jetting head as set forth in claim 1, wherein the laminated
2 film includes a part of layers forming the piezoelectric elements.
- 1 9. The liquid jetting head as set forth in claim 1, wherein:
2 the first substrate is comprised of a silicon monocrystalline substrate;
3 the pressure chambers and the first through hole are formed by

4 etching process; and
5 the upper electrode, the lower electrode and the piezoelectric layer
6 are formed by at least one of the film-forming process or a lithographic
7 process.

1 10. The liquid jetting head as set forth in claim 9, wherein a layer forming
2 the laminated film which is the closest to the first substrate is comprised of an
3 etching-resistant material.

1 11. An liquid jetting apparatus, comprising the liquid jetting head as set
2 forth in any one of claims 1 to 10.

1 12. A method of manufacturing an liquid jetting head, comprising the
2 steps of:

3 providing a first substrate, which defines a plurality of pressure
4 generating chambers, the first substrate including a vibration plate which forms
5 a first surface of the first substrate, and formed with a first through hole;

6 forming a plurality of piezoelectric elements on the vibration plate so
7 as to associate with one of the pressure generating chambers, each
8 piezoelectric element comprised of an upper electrode, a lower electrode and a
9 piezoelectric layer provided between the upper electrode and the lower
10 electrode;

11 providing a second substrate formed with a second through hole;

12 bonding the second substrate onto the first surface of the first
13 substrate with an adhesive agent, while forming a coating layer comprised of a

14 resin material on an inner wall face of a region at which the first through hole
15 and the second through hole are to be connected; and
16 forming a communicating portion at which the first through hole and
17 the second through hole are connected.

1 13. The manufacturing method as set forth in claim 12, wherein the
2 adhesive agent is extended so as to protruded from the inner wall face to form
3 the coating layer.

1 14. The manufacturing method as set forth in claim 12, wherein the
2 communicating portion is formed by a mechanical processing.

1 15. The manufacturing method as set forth in claim 12, wherein the
2 communicating portion is formed by a laser processing.

1 16. The manufacturing method as set forth in claim 12, further comprising
2 the step of bonding a nozzle plate on a second surface of the first substrate
3 opposing to the first surface, the nozzle plate formed with a plurality of nozzle
4 orifices each communicated with one of the pressure generating chambers,
5 wherein the bonding step of the nozzle plate is performed before the
6 forming step of the communicating portion.

1 17. The manufacturing method as set forth in claim 12, wherein:
2 the steps are performed with respect to a wafer in which a plurality of
3 first substrates are integrally formed; and

4 the respective first substrates are divided after the forming step of the
5 communicating portion.

1 18. The manufacturing method as set forth in claim 17, wherein the
2 coating layer is formed on an outer peripheral face of a bonding surface of
3 each first substrate and an associated second substrate.

1 19. The manufacturing method as set forth in claim 12, wherein:
2 the pressure chambers and the first through hole are formed by
3 etching a silicon monocrystalline substrate; and
4 the upper electrode, the lower electrode and the piezoelectric layer
5 are formed by at least one of the film-forming process or a lithographic
6 process.

1 20. The manufacturing method as set forth in claim 12, further comprising
2 the step of covering the coating layer with a protective layer comprised of a
3 resin material.